

D. FOLSOM

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SEPTEMBER, 1926

THE PRODUCTION OF MOSAIC—FREE TRIUMPHS

A. G. Tolaas

During the winter of 1924 an attempt to develop some new Bliss Triumph foundation stock was begun, by obtaining some selected hills from one of the best Triumph fields under inspection in the state. These tubers were dug in the fall of 1924, sent to University Farm and a half tuber from each hill unit was grown in the greenhouse for the purpose of getting mosaic readings. According to this method of indexing, we obtained 35 hill units which were free of mosaic. These hill units were planted on an isolated piece of ground in 1925 and the plot carefully inspected several times during the growing season. We could detect no mosaic, and since the conditions for determining mosaic were favorable, we concluded that the units with which we were working were free from it. The progeny from each hill unit was harvested separately, (the yield from each unit averaging about 40 lbs. of potatoes) and stored in the cold storage plant at University Farm.

A form letter offering one lot of this stock to a grower was sent to all Triumph growers whose fields we inspected in 1925, with the understanding that the potatoes be planted on an isolated piece of ground and given the best of care. Within a week all of the lots had been spoken for and the lots were sent to the growers this spring when danger of freezing was over. We have inspected nearly every one of these plots to date and it is gratifying to note that they are all free of mosaic. Each one of the growers who received one of these lots is highly pleased and most of them will have enough stock to plant one to one and a half acres next year.

Each grower will submit a 100-tuber sample of this stock for tuber indexing this fall, which should give us some idea as to whether any infection has taken place this summer.

In 1925 we made a requirement that all Triumph growers intending to have their fields inspected for certification this year submit a sample of their seed stock for tuber indexing. In all 27 lots

were indexed, the mosaic count running from 3 per cent in some lots to as high as 98 and 100 per cent in others. Out of all the lots indexed only six or seven were good enough to plant for certification. Two of these lots were especially free of mosaic and were recommended to Triumph growers as foundation stock. Several fields planted with this stock for certification showed a very small percentage of mosaic or spindle tuber infection during the first field inspection.

One of our Triumph growers who is intensely interested in producing mosaic-free Triumphs has planted a 5 acre plot of the best Triumph stock obtainable, by the tuber unit method, using an **automatic cutter** and **planter** so constructed as to skip one hill between each unit of 4 hills. On inspection this plot was remarkably free of diseased plants, and the fact that it was planted on the tuber unit basis has made roguing comparatively easy and effective. This particular grower has also been carrying on a number of tuber line selections with Triumphs for the past two years and we are watching his work with considerable interest.

This is just a brief summary of the attempt we are making to improve the Triumph stock in the state. Owing to the fact that we have not had available greenhouse space, we have been considerably handicapped in the matter of tuber indexing stock. Plans are under way to build a greenhouse 60 ft. by 18 ft. which we hope will be ready by the first of October and which is to be used exclusively for this work. This will enable us to make a regulation that every grower intending to have his potatoes inspected for certification must submit a sample of his seed stock for indexing. Our aim is to keep an index record of each grower's seed stock from year to year. Such a record should be of value in connection with the field inspection records, and to buyers of certified seed potatoes.

CROP AND MARKET NEWS

POTATO MARKETS TEND UPWARD

(Contribution from the Fruit and Vegetable Division, Bureau of Agricultural Economics, U. S. Department of Agriculture)

Since the middle of August carlot potato shipments have fallen to below average market requirements. The cause was supposed to be the rapid clearance of the intermediate crop and the lateness of the main crop states, made still later by weather unfavorable for digging.

Prices recovered steadily and potatoes were selling higher than last season the first half of September, at times exceeding \$3 per hundred pounds in Chicago, and shipments were still at the rate of only about 500 cars per day. The intermediate potato sections have shipped more than last season but the main crop states are

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reported one to three weeks late and not inclined to rush the crop to market early. This year's shortage was not specially marked in the early and intermediate regions but was quite generally distributed and there was no need for shipments of the main crop to make up summer deficiency. The situation called mainly for steady clearance of one section after another, a satisfactory state of affairs for all concerned.

Sources of potato supply have been shifting gradually to the main crop region but New Jersey, Long Island, Nebraska, and sections of Minnesota and the Rocky Mountain states are still shipping heavily.

The price in early September was about 10 per cent above the September average of the preceding five years. Prices usually, but not always, dip lower in October and November before the winter rise begins, if there is one. Usually there is such a rise in a year of light production. Accordingly, those who do not sell early and find the price lower in the main digging season may hopefully plan to store part of their crop. Judging from the estimated size of the crop and assuming general conditions to be about the same as last season, the price might be expected to run somewhere between the recent country-wide average of about \$2.50 per one hundred pounds and last season's average of more than \$3.50 for main crop potatoes. That is to say, the price would hardly go as high as last season, the production being somewhat larger.

Shortage of potatoes seldom runs into any real scarcity. Potatoes can be shipped across the country if the price is high enough to make it pay. Last season the shortage brought a thorough clearance in potatoes of all grades, including considerable poor stock, but total carlot supplies were about as heavy as usual. No doubt many families buy less when prices are high but others must buy more because their home gardens partly failed along with the general crop.

No very serious competition is to be expected from Canada because at last accounts that country had a crop below average. Canadian potatoes may be expected again to equal perhaps five per cent of the carlot supply, but based on last year's performance and the relative yields there would not be enough potatoes from Canada to lower the price level much. Competition with other vegetables might be a little more noticeable than last season owing to the larger crops of cabbage, onions, and sweet potatoes.

The present market level is neither especially high nor low. The September level in city markets so far has been generally \$2.25 to \$3 per hundred pounds, or possibly a country-wide average of \$2.50 against \$2.25 average a month ago and a year ago.

The September report showed the expected gains in production following liberal rainfall in sections previously affected by drought. The gain during August amounted to 6,000,000 bushels but total is still 44,000,000 below the five year average and only 26,000,000

above last year's crop. Improvement was chiefly in the northern Great Lakes region and the middlewest and was partly offset by the losses in the eastern states, including such leading producing regions as Maine, New York and Pennsylvania. Colorado, Idaho, and the far west about held their own during August but reports coming later show some damage by disease following excess heat and moisture.

Connecticut.—Irish Cobblers prematured quite generally over the state, due to the dry weather of June and July. This variety is being dug now and light yields are reported in most cases.

Green Mountains, the principal variety grown in Connecticut, are looking very well at this time, especially on the farms where good spraying is practiced. However, the tubers were set before the drought was broken, which will probably result in few, but large potatoes per hill.

Prices have advanced during the past few days and range from \$1.50 to \$2.00 per bushel for No. 1 stock now. The prospects seem good for at least \$2.00 potatoes this winter in Connecticut.—**B. A. Brown, Aug. 26.**

Michigan.—The potato crop in Michigan is in excellent condition at present. Most sections of the state have had ample rainfall during August and vine growth and set of tubers are good. Fields listed for inspection are exceptionally good and it is believed that the percentage of rejections will be lighter this year than heretofore.

Today while making observations in one of the Upper Peninsula counties I saw one field that showed slight infection of late blight. I think this is the first late blight reported this season for Michigan. In a few sections of the state the July rainfall was 4 inches or more and it is likely that some blight may occur in these districts. It has been about 12 years since late blight was of an epidemic nature here. In the Upper Peninsula some fields were injured by frost on the night of September first.

Prof. G. L. Tiebout of the University of Louisiana is making a trip through Michigan this week studying conditions of certified seed fields.—**H. C. Moore, Sept. 3.**

Minnesota.—The Hollandale District will have 3600 cars of potatoes to harvest this fall. Although we had an exceptionally dry season, recent rains have come in time to produce a good crop of fine quality potatoes.

There are 210 growers of certified Irish Cobbler Seed at Hollandale and it is expected that about a thousand cars of certified seed will be shipped this fall.

Much interest in certified seed is in evidence as many inquiries are already coming in from all points in the South.—**P. N. Davis, Aug. 18.**

Montana.—Northern Montana Potato Tour under the directions of Prof. F. M. Harrington and his assistants was the best in the history of the certification industry. The party included Prof. G.

L. Tiebout and others from Louisiana, several railroad representatives from different parts of the country and about fifty of our local growers.—**J. F. Sharples, Aug. 31.**

Nebraska.—The Nebraska potato tour held Aug. 4, 5, and 6, was unusually well patronized by southern commercial interests. The tour was outlined so as to give these visitors an opportunity to become thoroly informed concerning the system of seed potato certification and the resulting product.

Indications are that the yield per acre in western Nebraska potato fields will be above normal. It is quite generally agreed that the acreage planted to potatoes is decidedly less than normal. The acreage that will finally be certified will be less than in 1925, tho the total crop of certified seed may be much the same. Rejections due to spindle tuber and fusarium (*eumartii*) have been the chief causes for acreage reduction.

The College of Agriculture in cooperation with the Nebraska Certified Seed Potato Growers Cooperative is working on a seed potato improvement program via the tuber index—tuber unit seed plat route.

The annual meeting of the Nebraska Potato Improvement Association will be held at Chadron, during the week of either December 6 or 13.

The Nebraska Certified Potato Growers Cooperative has adopted a very distinctive type of tag which will probably be copyrighted and given wide publicity at an early date.—**H. O. Werner, Aug. 30.**

Fredericton, N. B.—"Potatoes are fully two weeks later than in 1925. The first digging of the Irish Cobbler variety will not be before the first of September. In the northern counties and near Grand Falls the Irish Cobblers are yet in bloom.

The total acreage is increased by one per cent over last year when there were 40,000 acres. The acreage of certified seed of the Irish Cobbler and Green Mountain varieties is placed at one thousand acres.—**O. C. Hicks, Sec'y N. B. Seed Potato Growers', August 21.**

Woodstown, N. J.—Our local market Saturday and today gave about an average of \$3.75 for 150 lb. sack.

It is very wet here and almost impossible to dig. Second crop seed potatoes are coming up good and strong. It looks now as though the demand for southern New Jersey seed potatoes would be very good.—**Senator J. Gilbert Borton, Aug. 23.**

Mineola, N. Y.—The potato season is in full swing on Long Island, Nassau County fields of Irish Cobblers are yielding very well indeed. The average I should estimate is about 300 bushels per acre. Most of the Green Mountain vines are nearly dead although there are some farms perfectly green at present. From observation it looks as though the Green Mountains will yield only an average crop as the flea beetles and leaf-hoppers have done con-

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siderable damage to this variety. Leaf hoppers have been much more numerous than I have ever seen here before.—H. C. Odell, County Agent, Aug. 23.

New York.—"As a result of the recent general heavy rains throughout New York State, some late blight has been reported from the Southern Tier counties, particularly Steuben County, and some in Cortland County. A few cases of blight rot have already been discovered in Steuben County, this being the leading carlot shipping region of the state outside of Long Island. Altho the crop is at present in good growing condition throughout the state weather conditions suitable for blight dissemination will in all probability result in a rapid dissemination of the disease.

"Growers from several parts of the state have reported a small set of tubers. There is a strong probability that this is due to the subnormal temperature which prevailed early in the growing season.

"The Long Island crop being at the height of harvest, appears to be not only of average yield but of excellent quality. There is a rather general opinion among growers that the market outlook this fall will be favorable."—E. V. Hardenburg, Sept. 3.

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ERROR IN MAILING AUGUST NUMBER

An error was made in addressing the envelopes for the August number. This error was not discovered until after the August number was in the mail and too late to check up. Consequently some of our members did not receive this issue. Upon receipt of a notice to this effect the August number will be mailed.

MEMBERSHIP

New members are being constantly added to our list which is very encouraging. Below is a list sent in since the August number was issued.

New Members	Obtained by
Walter Jones, Victoria, B. C.	W. Sandall
C. W. Buckle, Brighthouse, B. C.	W. Sandall
J. O. Hyndman, P. E. I.	Wm. Peppin
Louis H. Muttart, P. E. I.	Wm. Peppin
C. E. Pickett, N. B.	O. C. Hicks
Stanley Martin, Dexter, Me.	C. F. Clarke
Heith Thornton, Springboro, Pa.	K. W. Laner
F. C. Norton, Rockland, Me.	V. C. Beverley
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Edward Reeves, Lysander, N. Y.	Arthur Reeves
W. A. Catlin, Tully, N. Y.	F. S. Hollenbeck

CERTIFIED SEED POTATO GROWERS

Our slogan should be—Every certified seed potato grower a member of the Potato Association of America and be a reader of the *American Potato Journal*. This can be accomplished for \$1.00 per year for each membership. This is a small amount in comparison with the amount invested in growing a crop of certified seed potatoes. The information gained by reading the *American Potato Journal* is worth many times its cost. You cannot make another investment in the seed potato industry that will pay greater dividends. The growers who think they know all about the potato industry are not the successful growers. On the other hand those who are continually seeking information are the growers who are making money. If you want to make more money growing potatoes, read this *Journal*.

There are states in which every certified seed potato grower reads the *American Potato Journal* monthly. In a later issue there will be published a list of these states.

DUES

Last month a notice was sent to every member who was in arrears with their dues. A large number responded promptly. Others have failed to date to take care of this **important** part of our association activities. This failure means checking thru a file of more than 1300 names and sending out another letter to all of those who have not paid their dues. This is no small task to ask of anyone

to do **outside of office hours.** Prompt response is more than appreciated.

PROGRESS IN POTATO MACHINERY

Many of the present growers can remember when crude potato machinery was used and in some cases no special machinery at all. The writer has helped to plant quite large acreages by dropping the seed pieces in every third plow furrow. When harvest time came they plowed out perhaps with the same plow that was used in the plowing and planting. The latter two operations were accomplished at the same time. To go into detail in giving an account of the development of potato machinery would fill a book. Not many have any conception of the number of patents that have been granted on potato machinery until they go thru the records at the United States Patent Office.

Step by step all forms of potato machinery have been improved until it seems practically perfect. Then it is only a short time before necessity calls for something better and more efficient.

New Planter

The Baker Valve Company of Minneapolis, Minnesota are now manufacturing a planter which cuts one tuber into four pieces and plants them as a separate unit. No one can measure the value of such a planter to the certified seed potato industry alone to say nothing about the indirect value to the potato industry as a whole. Planting potatoes in units is a big aid in roguing or in other words in eliminating disease. Better seed means larger yields.

New Digger

The Fred H. Bateman Company of Philadelphia, Pa. are selling now a digger that can be attached to a Fordson tractor so as to receive its power directly from the tractor. Judging from the illustrations the writer has seen it looks as if it could deliver the goods.—**Walter M. Peacock**

INDEXING TUBER UNITS

Prof. A. G. Tolaas' experiment in developing mosaic-free Triumphs is a contribution to potato science. The writer believes that the secret in this accomplishment may be traced to the fact that half of a tuber was used in indexing each tuber in the greenhouse instead of planting a small piece with eye which many times is less than one-fifth of the tuber.

It is a known fact that part of the tuber may be affected with one of the virus diseases and the other part apparently healthy. By taking a half of a tuber and planting it by the index method a



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Is your crop a satisfactory one? And what is your per bushel cost of production?

Ask yourself these and other questions. If you are not satisfied with your per acre yield and your per bushel cost of production, and if you are satisfied that your seed and cultural practices have been correct and seasonal conditions are not responsible, it will pay you to check up on the amount and kind of fertilizer which you are using.

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more accurate behavior of the tuber may be obtained than by planting one-fifth of it.

Recently the writer in taking notes on a seed improvement experiment in New Jersey found quite frequently a unit that would be part diseased and the other plants of the unit apparently healthy. Sometimes it would be the first two plants diseased and the last two plants of the unit healthy, or vice versa; or one diseased hill and three healthy ones and sometimes only one healthy one. This characteristic seemed to be true in units affected with leaf-roll, mosaic, and spindle tuber.

If the diseased tubers can be absolutely eliminated before planting them in the seed plot in the field more than half the battle is won.—**Walter M. Peacock.**

CROP REPORTERS

Every reader of this publication is interested in learning about the crop in other sections. For this reason we are aiming to have better "Potato Notes Including Certification" than ever before. The men who are listed below have been requested to report on the growing, storage and marketing the crop for their country, province or state.

E. D. McSweeney, Rosemead, Los Angeles, (southern) Calif.
 Herbert Zuckerman, 409 Koerber Bldg., Berkeley, (northern) Calif.
 W. C. Edmundson, Greeley, Colo.
 B. A. Brown, Storrs Agr'l Expt. Station, Storrs, Conn.
 G. W. Waller, Hastings, Florida.
 Chas. W. Hungerford, College of Agr., Moscow, Idaho.
 O. C. Boyd, Thomasville, Georgia.
 K. P. Bemis, 192 No. Clark St., Chicago, Ill.
 E. R. Lancashire, Hort. Dept., Purdue Univ., La Fayette, Ind.
 C. L. Fitch, Iowa Exp. Station, Ames, Iowa.
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 John S. Gardner, Expt. Station, Lexington, Kentucky.
 G. L. Tiebout, Louisiana State Univ., Baton Rouge, La.
 E. L. Newdick, Dept. of Agr., Augusta, Maine.
 Fred W. Geise, Agr'l College, College Park, Maryland.
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 Earl M. Page, Univ. of Missouri, Columbia, Missouri.
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Seed Potatoes**SABIN, MINNESOTA**

A. H. Gilbert, Univ of Vermont, Burlington, Vt.
 H. H. Zimmerly, Va. Truck Expt. Station, Norfolk, Va.
 Geo. L. Zundel, Agr'l College, Pullman, Washington.
 Dee Crane, Morgantown, West Virginia.
 J. W. Brann, College of Agr., Madison, Wisconsin.
 A. F. Vass, Univ. of Wyoming, Laramie, Wyoming.

Canada

C. Tice, Dept. of Agriculture, Victoria, British Columbia.
 Guy R. Bisby, Agr'l College, Winnipeg, Manitoba.
 O. C. Hicks, Dept. of Agr., Fredericton, New Brunswick.
 J. F. Hockey, Kentville, Nova Scotia.
 John Tucker, Ontario Agr'l College, Guelph, Ontario.
 S. G. Peppin, Expt. Farm, Charlottetown, Prince Edward Island.
 W. H. Tawse, MacDonald College, St. Anne de Bellevue, Quebec.
 J. W. Scannell, Univ. of Saskatchewan, Saskatoon, Sask.

England

Sutton & Sons, Reading, England.

Orange Free State

J. B. Lurie, Tweesprint, Orange Free State, South Africa.

Russia

S. M. Bukassoff, Bur. of Applied Botany, Marskay 44, Leningrad, Rus.

Scotland

Thos. P. McIntosh, 10 Craighouse Terrace, Edinburgh, Scotland.

REVIEW OF RECENT LITERATURE

GLYNNE, MARY D.—The viability of the winter sporangium of *Synchytrium endobioticum* (Schilb.) Perc., the organism causing wart disease in potato.—*Ann. Appl. Biol.* 13: 19-36. 1926.

Further progress has been made toward developing tests of the viability of the wart organism in the soil which can be applied to field conditions. A method of staining the resting spores is described which distinguishes between spores which are killed, injured, or unaffected by disinfectant treatments, and a new method of isolating spores from contaminated soil is published. Previous work on soil disinfection by heat or chemicals to exterminate potato wart has suffered particularly from the lack of a ready and effective method of testing the viability of the resting spores after subjecting them to various treatments. This defect is overcome by this staining method which makes use of acid fuchsin, or methylene blue when the spores have been subjected to an alkaline chemical. Uninjured spores stain but faintly, whereas killed ones stain rapidly and deeply. These results were confirmed by planting tests to determine the infective capacity of the spores classified according to staining reaction.—Moist resting spores are all killed by exposure to the following range of conditions: 90 deg. C. for 5 minutes, 80 deg. for 15 minutes, 70 deg. for 1 hour, and 60 deg. for 8 hours. To kill dry spores relatively higher temperatures or longer exposures are necessary; thus at 80 deg. C. the spores, if dry, are not all killed in 1½ hours, nor at 70 deg. in 20 hours. The bearing of this on soil sterilization by steam is obvious.—The same staining reactions could also be employed to determine the condition of spores subjected to chemical treatments. Sulfuric acid was toxic only in one fifth normal or stronger solutions and with exposures of 24 hours and more. One per cent formaldehyde was resisted for 24 hours. The other chemicals tested required similar concentrations and exposures.—F. Weiss.

Goss, R. W.—Transmission of potato spindle-tuber by cutting knives and seed piece contact.—*Phytopath* 16: 299-303. pl. 16. Apr. 1926. No. 4.

Healthy quarter-tubers were inoculated by rubbing the freshly cut surface with fresh surfaces of spindle tuber potatoes; in a second experiment fresh surfaces of healthy tubers were rubbed with a knife which had just cut spindle tuber potatoes; in both cases corresponding quarters of the same tubers were planted as controls. Spindle tuber symptoms appeared in 32 to 47 per cent of the plants from the inoculated seed pieces as early as the disease could be recognized in known spindle tuber stock. Careful selection to eliminate spindle tuber before cutting is suggested.—Philip Brierley.

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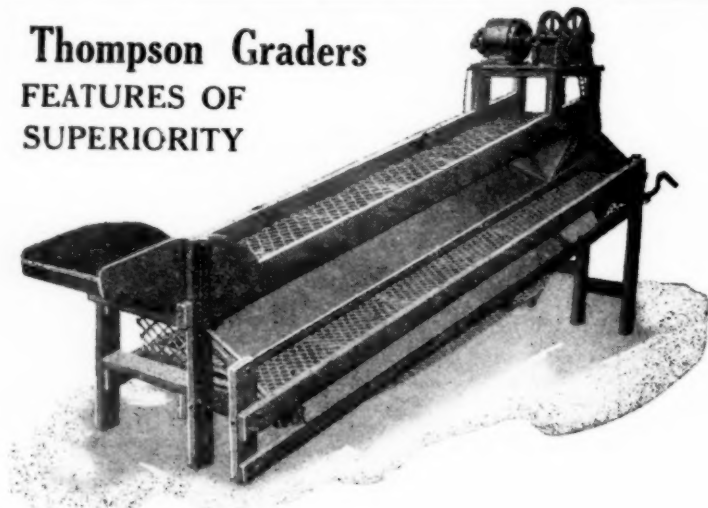
There can be many reasons why Mr. — did not produce the same high quality seed of last year. As one of South Jersey's largest and most experienced growers of certified Cobbler seed potatoes, I keep posted on the best strains and growing conditions of the crop from start to finish, and selected only from those fields that have required the least amount of roguing to meet the State requirements. I guarantee to furnish what I believe to be the best certified second crop Cobbler seed potatoes produced in South Jersey—S. S. S. S. Brand has been thoroughly tested in the Carolinas and in Alabama.

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823
MCLEAN, W.—Effect of leaf-roll disease in potatoes on the composition of the tuber and "mother tuber".—*Jour. Agr. Sci. (England)*, 16 (1926), No. 2. pp. 318-324. fig. 1.

Analyses at the University College of North Wales, Bangor indicated that tubers from "secondary" leaf-roll potato plants have a lower dry matter content than tubers from healthy plants. The percentage of nitrogen in the dry matter is appreciably higher in the former than in the latter. The difference in dry matter content is large enough in many varieties to characterize leaf-roll tubers. Seventeen varieties were examined. The rate at which nutrients are removed by the young plants from leaf-roll mother tubers appears to be much slower than in the case of plants from healthy mother tubers, which may be a cause of the stunting characteristic of leaf-roll plants.—H. M. Steece.

831 phy
SALMON, E. S. AND WARE, W. M.—Note on the occurrence of diseased shoots arising from potato tubers infected by *Phytophthora infestans*.—*Ann. Appl. Biol.* 13: 289-300. Pl. v. My. 1926 No. 2.

The authors review in detail the work of deBary, Jenson, Pethybridge, and Melhus showing that diseased shoots may arise from

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blight infected tubers and record an experiment of their own in which 2 of 25 naturally infected tubers planted early in April in pots in a greenhouse developed diseased shoots on which *Phytophthora* fruited.

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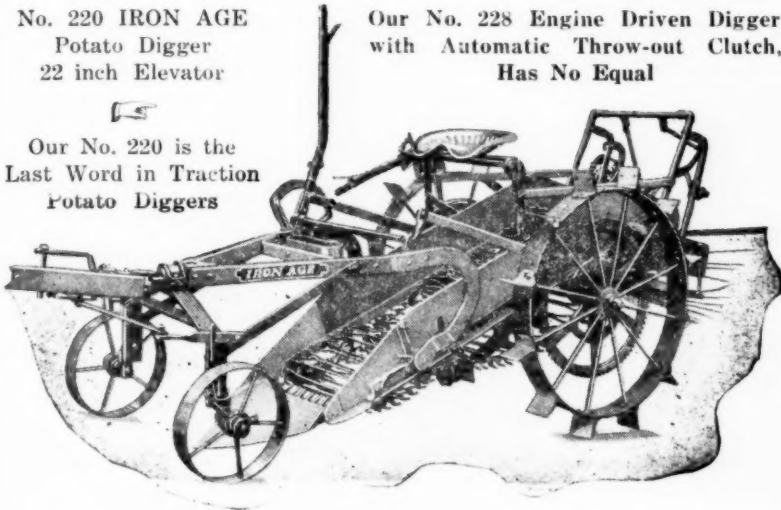
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